

REMARKS

In the Office Action dated August 5, 2004, the Examiner rejected claims 1-14 and 21-42 under 35 U.S.C. § 103 as being unpatentable over *Benenati* (U.S. Patent No. 5,227,179). For the reasons given below, Applicant respectfully submits that *Benenati* does not disclose, teach, or even suggest the presently claimed invention.

The present application discloses a quick and efficient method for manufacturing unitary manifold plates. As previously established in the Declaration by Terry Schwenk, which was submitted by Applicant to the Examiner on November 26, 2003, such an expedient manufacturing method has never been done before in the hot runner industry. On the contrary, due to the customization and complex engineering associated with hot runner systems, it has traditionally taken 6-8 weeks at least, and frequently even longer, to engineer, manufacture, and assemble hot runner systems. Indeed, the traditional method for engineering, manufacturing, and assembling hot runner systems is to wait for a customer to place an order, and then completely engineer, manufacture, and assemble the customer's specified hot runner system from scratch. The engineering, designing, tooling, machining, and assembling involved in such a process takes several weeks, if not months, to complete.

For obvious reasons, there has been a great demand in the hot runner industry for dramatically reducing the time it takes to engineer, manufacture, and assemble hot runner systems based on customers' specific design criteria. The present invention has satisfied this customer demand by engineering, manufacturing, and assembling hot runner systems in a much shorter period of time – only a few days – than traditional methods, while still allowing customers flexibility in choosing their design parameters. This more efficient

and expedient method is achieved by pre-manufacturing certain components, such as manifolds and manifold plugs, necessary for the hot-runner systems before they are ordered, thereby saving weeks of design and manufacturing. Additionally, the manifolds of the present application are a single, unitary structure which requires fewer parts for assembly. No other hot runner assembly system can produce unitary manifolds in an efficient manner like the present application. These improvements account for the shorter assembly time of the present hot runner system.

Benenati discloses the assembling of a non-unitary manifold built from a plurality of modular components. The modular manifold constructed by *Benenati's* assembly process results in a complex, multi-part, interlocking structure. As stated in *Benenati*, the individual manifold components used to build the modular manifold may be taken from inventory. As known in the art, however, the multi-part, interlocking manifolds made from these modular components are prone to leaking at their various joints, and thus do not provide adequate manifold structure for many types of hot runner systems.

In stark contrast to the multi-part, interlocking manifolds disclosed by *Benenati*, unitary manifolds do not have these joints and their associated leaking, and therefore are much more reliable for many hot runner systems. Unlike *Benenati's* multi-part, interlocking manifolds, as well known in the hot runner industry, "unitary" manifolds are comprised of undivided, whole manifold plates that form a complete unit not made from separate components. This construction of "unitary" is also fully supported by Merriam-Webster's Online dictionary, which defines "unitary" as "having the character of a unit: **UNDIVIDED, WHOLE.**" *Benenati* itself even abides by this same definition of "unitary" when describing the differences between unitary manifolds and interlocking

modular manifolds. Indeed, *Benenati* clearly distinguishes its multi-part interlocking modular manifolds from unitary manifold plates (referred to as "blocks of steel"), and teaches away from such unitary manifolds. See *In re Grasselli*, 713 F.2d 731, 743 (Fed. Cir. 1983) (It is improper to combine references where the references teach away from their combination.). As stated in *Benenati*:

Manifolds have been made of a block of steel that is bored to provide the passages for the molding material. The manifold is heated by electric heating elements in grooves in the manifold's steel block. ***The unitary block of steel*** securely contains the fluid in the manifold's passages, despite pressures of perhaps two thousand pounds per square inch. Where the passages extend from the bores of the manifold into the manifold's nozzles, the abutting surfaces of the parts are made flat with high precision and securely clamped together to prevent leaks. ***The same care in avoiding leaks must be observed where two or more blocks are combined in a manifold.***

* * * *

An object of the invention is to provide a novel heated manifold which can be produced economically and quickly. More particularly, an object of the invention is to provide ***a novel manifold that can be assembled of interlocking prefabricated standardized components requiring only minor machining.***

Benenati, col. 1, lns. 31-42 and 61-66.

Modular manifolds made by assembling several identical manifold components to a central manifold component have been known for years. A person skilled in the art would know, however, that modular manifolds and unitary manifolds are two very different types of manifolds that serve different purposes and are structurally distinct. Indeed, *Benenati* has to provide many more manufacturing steps to manufacture his multi-part modular manifold than the current invention needs to manufacture its unitary manifold plates. For example, *Benenati* requires machining highly accurate slots 10 and manufacturing highly accurate locking components (i.e., bushings 12). These additional

steps and components are not required by the unitary manifold plates of the present application. Consequently, the modular manifold method disclosed by *Benenati* is neither useful nor applicable for fast manufacturing of unitary manifolds, as disclosed and claimed in the current application. Thus, the use of a unitary manifold in *Benenati* would render the assembly system inoperable. If the proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. *In re Gordon*, 733 F.2d 900, 902 (Fed. Cir. 1984). In this case, if the manifolds in *Benenati* were made unitary, there would be no need to assemble interlocking manifold components because there are no components to assemble in a unitary manifold design. Thus, the system would become unsatisfactory for its intended purpose of prefabricating manifolds from interlocking components. Therefore, the Examiner's proposed modification is erroneous.

The Examiner argues that "[i]t would have been obvious to one having ordinary skill in the art at the time the invention was made to provide a unitary manifold plate, since it has been held that forming in one piece an article which has formerly been formed in two pieces and put together involves only routine skill in the art," citing *Howard v. Detroit Stove Works* and *In re Larson* for support. However, in both of these cases, forming an article as one piece was merely a design consideration; there was no real structural difference in the two products.

For example, the Board in *In re Larson* reasoned that "[making the brake drum integral with the clamping means] does not contribute to a better heat transfer in appellants' construction . . . [and] [n]o difference in structure has been pointed out that would afford an unobvious improved heat transfer from the brake to the cargo fluid."

340 F.2d 965, 968 (CCPA 1965). In other words, merely forming in one piece that which was formerly two pieces did not provide an unobvious improvement to the prior art because it was simply an engineering design choice. *Id.* The general structure and function of the vehicle assembly as a whole remained the same. *Id.*

On the contrary, the unitary manifold plate of the present application has a completely different structure, and functions in a substantially different manner than the multi-part manifolds of *Benenati*. Indeed, these unitary manifolds are a great improvement over multi-part manifolds because they are structurally stronger and prevent joint leakage. Moreover, the unitary manifolds of the present application do not require the extra assembly that is required to produce the multi-part manifolds of *Benenati*. As a result, the unitary manifolds of the present application may be used in a number of injection molding applications that are unsuitable for the multi-part manifolds of *Benenati*.

Applicants refer the Examiner to section 2144.04 of the MPEP "Making Integral," which cites to *Schenck v. Nortron Corp.* in addition to *In re Larson*. In *Schenck*:

Nortron argued that the invention is just making integral what had been made in four bolted pieces. The court found this argument unpersuasive and held that the claims were patentable because the prior art perceived a need for mechanisms to dampen resonance, whereas the inventor eliminated the need for dampening via the one-piece gapless support structure, showing insight that was contrary to the understandings and expectations of the art.

MPEP, § 2144.04; 713 F.2d 782, 785 (Fed. Cir. 1983).

Therefore, the courts have recognized situations where, contrary to the Examiner's statement, it would not have been obvious to form in one piece an article which has formerly been formed in two pieces. Such is the case here. In fact, only with

impermissible hindsight would one of ordinary skill in the art think to replace the multi-part modular manifold plates in *Benenati* with unitary manifold plates to arrive at the presently claimed invention. The combination of elements in a manner that reconstructs Applicant's invention only with the benefit of hindsight, however, is insufficient to present a prima facie case of obviousness. See *In re Oetiker*, 977 F.2d 1443, 1447 (Fed. Cir. 1992).

Other than using modular manifold pieces from inventory for building a multi-part, interlocking manifold, *Benenati* does not disclose manufacturing hot runner system components, placing them into inventory, accepting customer orders for hot runner systems, and removing the components from inventory for modifications or further manufacturing of the hot runner systems that correspond to specifications of customer orders. All of the currently pending claims, however, recite these method steps. In addition, the present claims recite that these methods are either for: (1) unitary manifold plates, as opposed to multi-part manifolds like those disclosed by *Benenati*; (2) manifold plates having substantially the same shape throughout manufacturing (unlike *Benenati's* multi-part manifolds); or (3) unitary manifold plates with a common melt inlet in communication with and perpendicular to one or more flow channels, which are in communication with the nozzles (unlike *Benenati's* multi-part manifolds). As a result, the presently claimed invention allows a customer a wide range of flexibility with respect to hot runner system configurations using unitary manifolds that do not leak, while providing a very fast manufacturing method for the hot runner system ordered by the customer.

Furthermore, the Examiner failed to consider some of the features recited in claims 27, 32, and 37, namely the "plurality of manifolds having predefined shapes," the "completed manifold plate having substantially the same shape as the predefined shape of the selected manifold plate," and "the melt inlet being substantially perpendicular to the flow channels." *Benenati* clearly fails to disclose, teach, or even suggest any of these features, and therefore does not disclose each and every limitation of the claims.

In addition, Applicant directs the Examiner's attention to the relevant secondary considerations associated with nonobviousness in the present application.

For example, the manufacturing method of the present invention alleviates a long-felt need in the art. "The fact that others have attempted to solve a known problem but have failed may . . . be an indication that a *prima facie* obvious invention was not obvious." *Minton v. Nat'l Ass'n of Sec. Dealers, Inc.*, 226 F. Supp.2d 845, 881 (E.D. Tex. 2002), *aff'd*, 336 F.3d 1373 (Fed. Cir. 2003). There has been a long-felt need in the art of hot-runner systems to develop an expedient method for manufacturing unitary manifolds, since it has traditionally taken 6-8 weeks at least, and frequently even longer, to engineer, manufacture, and assemble hot runner systems due to the customization and complex engineering associated with hot runner systems. *See Schwenk Decl.* paragraph 4. The present application satisfies this long-felt need by pre-manufacturing certain components, such as manifolds and manifold plugs, necessary for the hot-runner systems before they are ordered. This pre-manufacturing saves weeks of design and manufacturing. Furthermore, as established above, the manifolds of the present application are each a single, unitary structure which requires fewer parts for assembly.

Benenati doesn't satisfy the long-felt need in the industry. This is evidenced by the fact that none of the main producers in the hot runner systems industry have adopted the system of *Benenati* to satisfy the need for the expedient manufacture and production of unitary manifolds. *See Bennett Decl.* paragraph 5. Therefore, because the prior art, like *Benenati*, has unsuccessfully tried to solve this problem, it is evident that a long-felt need has existed (and still did exist prior to the present invention). The present application clearly satisfies this long-felt need in the hot runner systems industry, however, and accordingly overcomes the obviousness rejection instituted by the Examiner.

Another factor to consider is the commercial success that Mold-Masters Limited (MML), the assignee of the present application, has experienced with the new and valuable method of the present application. Obviousness rejections may be overcome where an invention has been found to "enjoy[] tremendous commercial success" *Symbol Tech., Inc. v. Opticon, Inc.*, 935 F.2d 1569, 1579 (Fed. Cir. 1991). As established by several Federal Circuit cases, copying by others in the industry of the invention is indicative of nonobviousness and commercial success. *See, e.g., Avia Group Int'l, Inc. v. L.A. Gear California, Inc.*, 853 F.2d 1557, 1564 (Fed. Cir. 1988); *Diversitech Corp. v. Century Steps, Inc.*, 850 F.2d 675, 679 (Fed. Cir. 1988); *Specialty Composites v. Cabot Corp.*, 845 F.2d 981, 991 (Fed. Cir. 1988); *Vandenberg v. Dairy Equip. Co.*, 740 F.2d 1560, 1567 (Fed. Cir. 1984). As illustrated by the various brochures of other companies submitted by Applicant (*see Bennett Decl.*, Exhibit A), many other producers of hot runner systems have copied MML's claimed invention and implemented the process of the present application (or one very similar to it) only *after* MML developed and began

using the process. *See Bennett Decl.* paragraph 6. This is an indication of the vast commercial success of the presently claimed method of manufacturing hot runner systems with unitary manifolds, and is therefore an indication of nonobviousness over the prior art.

For the above reasons, it is clear that *Benenati*, alone or in combination with any other reference, does not anticipate or render obvious the present claims. Additionally, Applicant's method remedies a long-felt need in the hot-runner industry, and has experienced great commercial success, which are both relevant indications of nonobviousness. Accordingly, Applicant respectfully requests that the Examiner withdraw the rejection of claims 1-14 and 21-42. Applicant believes the present claims to be in condition for allowance, and earnestly request early notification of same.

If, for any reason, the Examiner is unable to allow the application on the basis of this amendment and feels that a telephone conference would help clear up any unresolved matters, the Examiner is respectfully requested to contact the undersigned attorney at the telephone number listed below.

Respectfully submitted,

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